Docket No.: TOK-98-2018-C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	TOSHIAKI FUJII ET AL.	) Group Art Unit: 3652
Serial No.:	10/036,802	) Examiner: Keenan, James W.
Filed:	December 21, 2001	) Confirmation No. 5368
For:	CONTAINER AND LOADER FOR SUBSTRATE	)

Via EFS-Web
Commissioner for Patents
P.O. Box 1450
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APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real parties in interest are the assignees of record: Rorze Corporation, Ebara Research Corporation, and Dainichi Shoji K.K.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellants or Appellants' legal representatives that will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 9 and 11-34 are pending in the application.

Claims 1-8 and 10 have been cancelled.

Claims 9, 11-15, and 24-34 stand rejected and form the basis of this appeal. Of these claims, claims 9, 24, 29, and 32 are independent claims.

Claims 16-23 also stand rejected, but appellants are not appealing the rejection of these claims and seek to cancel claims 16-23.

IV. STATUS OF AMENDMENTS

An Amendment was submitted on January 12, 2007. The amendments contained therein were not entered for purposes of appeal, as indicated in the advisory action dated January 29, 2007.

A Pre-Appeal Brief Request for Review was filed on February 12, 2007 along with the Notice of Appeal. The resulting panel decision, issued March 1, 2007, indicated that the application was to proceed to the Board of Patent Appeals and Interferences.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claims 9, 24, 29, and 32 are the independent claims at issue in this appeal. The citations to the specification indicated below are made with reference to the clean version of the substitute specification submitted on January 20, 2003.

Claim 9 is directed to a loader disposed in a low cleanliness room in a border between the low cleanliness room and a high cleanliness room having a higher pressure than the low cleanliness room. In particular, the loader comprises a movable stage (e.g., element 107 of present Figure 2) positioned in the low cleanliness room for mounting a container (e.g., element 102 of present Figure 2) in such a manner that the entire container remains in the low cleanliness room, and a cover (e.g., element 103 of present Figure 2) to be removed from a main body of the container is positioned to face the high cleanliness room, the movable stage being horizontally movable relative to a wall (e.g., element 105 of present Figure 2) that separates the low cleanliness room from the high cleanliness room (see page 14, line 9 through page 15, line 5 of the present specification). The loader of claim 9 further comprises an opening portion (e.g., element 112 of Figure 2) in the wall through which a dust free article is transported between an inside of the container and a high cleanliness room (see page 13, lines 18-20 and page 15, line 22 through page 16, line 1 of the present specification); a door (e.g., element 104 of present Figure 2) for opening and closing the opening portion (see page 13, lines 18-20 of the present specification); a unifying means for unifying the cover of the container and the door in the low cleanliness room (see present Figures 8A-8B and page 15, lines 6-9 and page 22, lines 7-21 of the present specification); a driving apparatus (e.g., element 106 of present Figure 2) positioned in the low cleanliness room for moving the cover and the door together within the loader to simultaneously open and close the opening portion and the container (see page 13, line 20 through page 14, line 2 of the present specification); and a gap (e.g., element 111 of present Figure 2) provided all around the door between the opening portion and the door through which air flows out from the high cleanliness room to the lower cleanliness room to prevent dust flowing into the high cleanliness room (see page 13, line 20 through page 14, line 2 of the present specification).

Claim 24 is directed to an apparatus for transporting a dust free article, the apparatus comprising a loader similar to the loader of claim 9 as described above. Additionally, claim 24 claims that the container comprises an opening port through which the dust free article is transported between an inside of the container and the high cleanliness room (see present Figure 4A, and page 15, line 22 through page 16, line 1 of the present specification); a cover

(e.g., element 406 of present Figure 4A) which covers the opening port of the container and is to be unified with the door of the loader, the cover and the door are adapted to move within the loader to open and close the opening port of the container (see page 17, line 15 through page 18, line 9 and page 19, lines 3-14 of the present specification); and a fixing means (e.g., element 405 of present Figure 4A) for fixing the cover to the opening port of the container when the dust free article is set in the container and is transported (see page 18, lines 2-4 and page 19, lines 3-9 of the present specification).

Claim 29 is directed to a method for transporting a dust free article, using a loader, provided with a movable stage, a door, a unifying means, and a driving means, disposed in a low cleanliness room in a border potion between a high cleanliness room having a higher air pressure than that of the low cleanliness room, and a container receiving the dust free article to be transported. In particular, the method comprises mounting the container receiving the dust free article on the movable stage (see page 14, lines 9-20 of present specification); causing the container to approach the door of the loader for opening and closing an opening portion of the loader (see page 14, line 21 through page 15, line 5 of the present specification); flowing air from the high cleanliness room to the low cleanliness room through a gap provided all around the door of the loader (see page 13, line 21 through page 14, line 2); unifying the cover of the container and the door of the loader in the low cleanliness room (see page 15, lines 6-9 of the present specification); moving the cover and the door unified within the loader to open the opening portion of the loader and the container (see page 15, lines 15-21 of the present specification); and transferring the dust free article received in the container from an inside of the container to the high cleanliness room through the opening portion of the loader (see page 15, line 22 through page 16, line 1).

Claim 32 is directed to a loader. In particular, the loader comprises a movable stage (e.g., element 107 of present Figure 2) for mounting a container (e.g., element 102 of present Figure 2) in such a manner that the entire container remains in a low cleanliness room, and a cover (e.g., element 103 of present Figure 2) to be removed from a main body of the container is positioned to face a high cleanliness room having a higher pressure than the low cleanliness

room, the movable stage being horizontally movable relative to a wall (e.g., element 105 of present Figure 2) that separates the low cleanliness room from the high cleanliness room (see page 14, line 9 through page 15, line 5 of the present specification). The loader of claim 32 further comprises a door (e.g., element 104 of present Figure 2) for opening and closing an opening portion (e.g., element 112 of Figure 2), provided in the wall, for transporting a dust free article between an inside of the container and the high cleanliness room (see page 13, lines 18-20 and page 15, line 22 through page 16, line 1 of the present specification); a unifying means for unifying the cover of the container and the door in the low cleanliness room (see present Figures 8A-8B and page 15, lines 6-9 and page 22, lines 7-21 of the present specification); a driving apparatus (e.g., element 106 of present Figure 2) for moving the cover and the door together within the loader to simultaneously open and close the opening portion and the container (see page 13, line 20 through page 14, line 2 of the present specification); and a gap (e.g., element 111 of present Figure 2) provided all around the door through which air flows out from the high cleanliness room to the lower cleanliness room to prevent dust flowing into the high cleanliness room (see page 13, line 20 through page 14, line 2 of the present specification).

Claims 9, 24, 29, and 32 each claim a unifying means for unifying the cover of the container and the door in the low cleanliness room. Present Figures 8A and 8B illustrate one possible example of such a unifying means, such as elements 801-811. As described on page 22, lines 7-21 of the present specification, one example of the unifying means can be protrusions that fit into holes one the cover of the container.

Claim 24 claims a fixing means for fixing the cover to the opening port of the container. Present Figure 4A illustrates one possible example of such a fixing means, such as O-ring 405. As described on page 18, lines 2-4 of the present specification, the container and the cover are air-tightly sealed by an O-ring. In addition to the O-ring, page 19, lines 3-9 of the present specification describes other possible embodiments of a fixing means, such as a magnet, adhesive tape, or clamp mechanism.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 9, 11-17, and 19-34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Muka et al. (US 5,613,821) in view of Briner et al (US 5,810,537) and Mastroianni (US 6,068,668). As noted above, applicants do not appeal the rejection of claims 16-23 and seek to cancel these claims. Therefore, the rejection is read as applying to claims 9, 11-15, and 24-34.

VII. ARGUMENT

The USPTO respectfully rejects claims 9, 11-17, and 19-34 under 35 U.S.C. § 103(a) as being obvious over Muka, in view of Briner, further in view of Mastroianni. Claims 9, 24, 29, and 32 are independent claims.

A. The cited references do not teach or suggest a unifying means for unifying the cover of the container and the door in the low cleanliness room, as claimed in claim 9.

Regarding the limitations of claim 9 that claim in relevant part:

> "a unifying means for unifying the cover of the container and the door **in the low cleanliness room;**" **(emphasis added)**

it is respectfully not seen where the cited references teach or suggest the claimed structure quoted above.

Specifically, the USPTO respectfully alleges on page 3 of the Office Action dated October 12, 2006 that Muka teaches a cover 42 unified with the door 80 in a low cleanliness room. Thus, because cover 42 and door 80 interact in mini-environment 58 of Muka, as seen in Figures 3-4 of Muka, the USPTO essentially alleges that mini-environment 58 is the claimed low cleanliness room of claim 9. See also the Office Action at page 7 where the USPTO respectfully states:

> "The fact remains that the mini-environment is exposed to the surrounding atmosphere, and thus is in the low-cleanliness room, **at least part of the time.**" **(emphasis added)**

However, the USPTO is technically incorrect (see column 5, lines 19-21 and column 6, lines 22-24 of Muka). Specifically, it is respectfully asserted that **mini-environment 58 of Muka is not a low cleanliness room.**

For example, as noted in column 5, lines 51-54 of Muka, mini-environment 58 "**sealingly isolat[es]** the load lock 22 and the interior 40 of the carrier 32 from the surrounding atmosphere" **(emphasis added)**. Furthermore, **both carrier 32 and load lock 22 are "substantially particle free environments"** (see column 5, lines 19-21 and column 6, lines 22-24 of Muka). Additionally, column 5, line 15 of Muka states: "within the **clean** mini-environment" **(emphasis added)**. Thus, it is clear that the USPTO is technically incorrect when it states on page 7 of the Office Action dated October 12, 2006 that "the mini-environment is exposed to the surrounding atmosphere, and thus is in the low-cleanliness room," **because the mini-environment 58 of Muka is a "clean mini-environment" as defined in the reference itself.** In fact, as Applicants previously noted in a response dated August 1, 2006, "mini-environment" is a well know term of art meaning a clean and contaminant-controlled wafer transfer area (see also section B below).

As further noted in column 6, line 62 through column 7, line 18 of Muka, load lock door 80 and carrier door 42 must both be opened during the transfer of wafers through mini-environment 58 into load lock 22, as is clearly illustrated in Figure 8 of Muka. Additionally, Muka explicitly states in column 8, lines 33-37 that:

> "It will be appreciated that operation of the multilevel end effector 84 cannot be achieved until the drive mechanism 118 has been operated to move the load lock door, the coupling device 98, and the carrier door 42 all to the lowered position as indicated in FIG. 8."

Therefore, it is respectfully clear that **mini-environment 58 is exposed to both carrier 32 and load lock 22 during the operation of the device in Muka**, at least when the wafers are transferred through mini-environment 58. Thus, because mini-environment 58 is exposed to both carrier 32 and load lock 22, it is respectfully reiterated **that mini-environment 58 cannot be a low cleanliness room.** If, as the USPTO respectfully suggests, mini-environment 58 is a low cleanliness room, then **the "substantially particle free environment" of carrier 32 and load lock 22 would be destroyed.** Therefore, in order for the device in Muka to serve its intended purpose, mini-environment 58 must inherently be a high cleanliness room, at least when the wafers are transferred. Therefore, the USPTO has made a clear and appealable technical error.

Thus, the USPTO's proposed interpretation of mini-environment 58 as a low cleanliness room **would render the device in Muka unsatisfactory for its intended purpose** because carrier 32 and load lock 22 would no longer be "substantially particle free environments" after the transfer of the wafers. Additionally, it is respectfully clear that **any modification of Muka to replace mini-environment with a low-cleanliness room would likewise render the device in Muka unsatisfactory for its intended purpose** (see MPEP 2143.01 V). Therefore, the USPTO is technically incorrect.

Additionally, it is respectfully asserted that the Briner and Mastroianni references do not overcome this deficiency in the primary Muka reference.

In contrast, present Figure 2 illustrates one possible embodiment of the claimed structure quoted above. Specifically, present Figure 2 illustrates a high cleanliness room to the right of wall 105 and a low cleanliness room to the left of wall 105 (see page 13 of the present specification). Additionally, as explained on page 15 of the present specification, **cover 103 and door 104 are unified, for example, by clamp mechanisms or frictional means.** It is respectfully important to note that this unification occurs to the left of wall 105 in the low cleanliness room, as shown in present Figure 2. In other words, **the unifying means is structured to unify the cover 103 of the container and the door 104 in the low cleanliness room**, as claimed in claim 9.

In Muka, however, cover 42 and door 80 are unified by a unifying means in mini-environment 58, as seen in Figures 3 and 8 of Muka. **However, as discussed above, mini-environment 58 is a high cleanliness room, not a low cleanliness room**, at least when the cover 42 and door 80 are unified during the wafer transfer. Therefore, Muka does not teach or suggest a unifying means for unifying the cover of the container and the door **in the low cleanliness room**, as claimed in claim 9.

Thus, it is respectfully asserted that the cited references, taken either alone or in combination, do not teach or suggest a unifying means for unifying the cover of the container and the door in the low cleanliness room, as claimed in claim 9. Therefore, it is respectfully asserted that claim 9 is not obvious over the cited references.

B. The USPTO impermissibly relies on the Examiner's unsupported personal or common knowledge to teach or suggest a specifically claimed limitation.

It is respectfully noted that under 35 U.S.C. § 103(a) all of the limitations of the claims must be taught or suggested **by the cited references** or **official notice** has to be taken (see MPEP 2144.03). As MPEP 2144.03A notes: "It is never appropriate to rely solely on "common knowledge" in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based. *Zurko*, 258 F.3d at 1385, 59 USPQ2d at 1697."

At page 7 of the Office Action dated October 12, 2006, the USPTO does not cite a reference or take official notice to teach the claimed limitation of "a unifying means for unifying the cover of the container and the door **in the low cleanliness room,**" **(emphasis added)** as claimed in claim 9. Instead, the USPTO relies on a statement of the Examiner's own personal knowledge in combination with Muka, wherein the Examiner respectfully states on page 7 of the Office Action that:

> "The fact remains that the mini-environment is exposed to the surrounding atmosphere, **and thus is in the low-cleanliness room, at least part of the time." (emphasis added)**

Thus, once again, it is respectfully reiterated that Muka does not teach or suggest that the mini-environment is a low cleanliness room. Instead, **Muka teaches the exact opposite, i.e., that the mini-environment is actually a high cleanliness room.** Specifically, as noted in column 5, lines 51-54 of Muka, mini-environment 58 "**sealingly isolat[es]** the load lock 22 and the interior 40 of the carrier 32 from the surrounding atmosphere" **(emphasis added)**. Furthermore, **both carrier 32 and load lock 22 are "substantially particle free environments"** (see column 5, lines 19-21 and column 6, lines 22-24 of Muka). Thus, as previously noted, mini-environment 58 of Muka is clearly a high cleanliness room according to Muka.

Instead, the Examiner appears to use his own personal knowledge **to contradict the teachings of the reference** and somehow impermissibly "fill in the gaps" to cover a major claimed limitation by stating that:

> "The fact remains that the mini-environment is exposed to the surrounding atmosphere, **and thus is in the low-cleanliness room, at least part of the time." (emphasis added)**

Further, MPEP 2144.03 (E) cites relevant case law and states:

> "Any rejection based on assertions that a fact is well-known or is common knowledge in the art without documentary evidence to support the examiner's conclusion should be judiciously applied. Furthermore, as noted by the court in Ahlert, any facts so noticed should be of notorious character and serve only to **"fill in the gaps" in an insubstantial manner** which might exist in the evidentiary showing made by the examiner to support a particular ground for rejection. **It is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based.** See Zurko, 258 F.3d at 1386, 59 USPQ2d at 1697; Ahlert, 424 F.2d at 1092, 165 USPQ 421." (**emphasis added**)

Furthermore, rejections without documentary evidence "should be rare when an application is under final rejection (see MPEP 2144.03(A)).

Additionally, the claimed limitation quoted above, specifically "a unifying means for unifying the cover of the container and the door in the low cleanliness room," is important because it reduces the likelihood that the mechanical operation of the device will contaminate the high cleanliness room, as noted on pages 5-6 of the specification.

Furthermore, the claimed structure of claim 9, i.e. a unifying means for unifying the cover of the container and the door **in the low cleanliness room, is not common knowledge because related art does not teach such a device.** As noted on pages 4-5 of the present specification, for example, other devices perform the transfer of dust-free articles **inside a high cleanliness room.**

Because the claimed limitation quoted above is important and not common knowledge, applicants "**seasonably challenge" and traverse the Examiner's reliance on personal or common knowledge and require that a reference be cited.** See MPEP 2144.03 stating:

> "C. If Applicant Challenges a Factual Assertion as Not Properly Officially Noticed or not Properly Based Upon Common Knowledge, the Examiner Must Support the Finding With Adequate Evidence
>
> To adequately traverse such a finding, an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art. See 37 CFR 1.111(b). See also Chevenard, 139 F.2d at 713, 60 USPQ at 241 ("[I]n the absence of any demand by appellant for the examiner to

> produce authority for his statement, we will not consider this contention."). A general allegation that the claims define a patentable invention without any reference to the examiner's assertion of official notice would be inadequate. If applicant adequately traverses the examiner's assertion of official notice, **the examiner must provide documentary evidence in the next Office action if the rejection is to be maintained**. See 37 CFR 1.104(c)(2). See also Zurko, 258 F.3d at 1386, 59 USPQ2d at 1697 ("[T]he Board [or examiner] must point to some concrete evidence in the record in support of these findings" to satisfy the substantial evidence test). **If the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding**. See 37 CFR 1.104(d)(2)." (**emphasis added**)

Thus, applicants respectfully assert that the rejection to claim 9 has been overcome.

C. Response to the USPTO's arguments.

On page 6 of the Office Action dated October 12, 2006, the USPTO respectfully alleges, "the claims do not require the low cleanliness room to be less clean than the high cleanliness room, nor do they require the high cleanliness room to be cleaner than the low cleanliness room."

However, it is respectfully asserted that one of ordinary skill in the relevant art would clearly understand that a low cleanliness room is less clean than a high cleanliness room, and that a high cleanliness room is cleaner than a low cleanliness room. Thus, it is respectfully asserted that it is not necessary to further define these terms, because they are standard American English terms that are clearly defined relative to each other. Therefore, the USPTO's reasoning is respectfully incorrect.

D. Independent claims 24, 29, and 32.

Applicants respectfully note that independent claims 24 and 32 claim a unifying means in a low cleanliness room, similar to claim 9. Additionally, independent claim 29 claims unifying the cover of the container and the door of the loader in the low cleanliness room and a loader in a low cleanliness room while an article is being transferred, similar to claim 9.

Thus, applicants respectfully assert that the issues with respect to independent claims

24, 29, and 32 are the same as the issues with respect to independent claim 9, as discussed above at sections A and B.

Accordingly, as noted above, it is respectfully asserted that the cited references, taken either alone or in combination, do not teach or suggest a unifying means for unifying the cover of the container and the door **in the low cleanliness room**. Therefore, it is respectfully asserted that independent claims 24, 29, and 32 are allowable.

E. The dependent claims.

As noted above, it is respectfully asserted that independent claims 9, 24, and 29 are allowable, and therefore it is further respectfully asserted that dependent claims 11-15, 25-28, 30-31, and 33-34 are also allowable.

VIII. CLAIMS APPENDIX

The claims below are the claims as they exist at the time of the Final Office Action dated October 12, 2006.

1-8. (Canceled)

9. (Previously presented) A loader disposed in a low cleanliness room in a border between the low cleanliness room and a high cleanliness room having a higher pressure than the low cleanliness room, the loader comprises:

a movable stage positioned in the low cleanliness room for mounting a container in such a manner that the entire container remains in the low cleanliness room, and a cover to be removed from a main body of the container is positioned to face the high cleanliness room, the movable stage being horizontally movable relative to a wall that separates the low cleanliness room from the high cleanliness room;

an opening portion in the wall through which a dust free article is transported between an inside of the container and the high cleanliness room;

a door for opening and closing the opening portion;

a unifying means for unifying the cover of the container and the door in the low cleanliness room;

a driving apparatus positioned in the low cleanliness room for moving the cover and the door together within the loader to simultaneously open and close the opening portion and the container; and

a gap provided all around the door between the opening portion and the door through which air flows out from the high cleanliness room to the lower cleanliness room to prevent dust flowing into the high cleanliness room.

10. (Canceled)

11. (Previously Presented) The loader of claim 9, wherein the driving apparatus is provided within a space formed by a front cover and a wall for the driving apparatus.

12. (Previously Presented) The loader of claim 9, wherein the cover and the door are adapted to move vertically together within the loader.

13. (Previously Presented) The loader of claim 9, wherein the container mounted on the stage approaches the door horizontally.

14. (Previously Presented) The loader of claim 9, wherein the unifying means for unifying the cover and the door comprises:

a pin to be inserted in a hole formed in a protrusion arranged on the outside of the cover;

another pin to be inserted in another hole formed in the door; and

a driving mechanism for simultaneously moving both of the pin and the another pin to unify the cover and the door.

15. (Previously Presented) The loader of claim 9, which further comprises a driving device for moving the container mounted on the stage to the door.

16. (Previously Presented) An apparatus comprising: a container for receiving and transporting a dust free article therein and to be mounted on a movable stage horizontally movable relative to a wall that separates a low cleanliness room from a high cleanliness room in such a manner that the entire container remains in the low cleanliness room, and a cover to be removed from a main body of the container is positioned to face the high cleanliness room having a higher pressure than the low cleanliness room,

wherein the movable stage comprises an opening portion disposed in the low cleanliness room in a border location between the high cleanliness room and the low

cleanliness room and a door for opening and closing the opening portion with a gap provided all around the door through which air flows out from the high cleanliness room to the lower cleanliness room to prevent dust flowing into the high cleanliness room; and

wherein the container comprises:

an opening port through which the dust free article is transported between an inside of the container and the high cleanliness room;

the cover which covers the opening port, wherein the cover is unified with the door of the movable stage in the low cleanliness room, and the cover and the door are adapted to move together within the movable stage to open and close the opening portion; and

a fixing means for fixing the cover to the opening port when the dust free article is enclosed in the container for transportation.

17. (Previously Presented) The container of claim 16, wherein the cover of the container moves vertically.

18. (Previously Presented) The container of claim 16, wherein an angle formed by an outward normal line of a surface on which the opening port is closely contacted with the cover and a descending direction of the cover unified with the door of the movable stage, forms an acute angle.

19. (Previously Presented) The container of claim 16, which further comprises a sealing material for closing both of the cover and the opening port.

20. (Previously Presented) The container of claim 16, which further comprises a positioning means to position the container in relation to the movable stage when the container is mounted on the movable stage.

21. (Previously Presented) The container of claim 16, which further comprises a handle to support the container when the container is transported.

22. (Previously Presented) The container of claim 16, which further comprises a protrusion formed on an outer portion of the cover, the protrusion having a hole to which a pin is inserted for unifying the cover and the door of the movable stage.

23. (Previously Presented) The container of claim 16, which further comprises an air cleaning device.

24. (Previously Presented) An apparatus for transporting a dust free article, which comprises:

a loader disposed in a low cleanliness room in a border portion between a high cleanliness room and a low cleanliness room having a lower pressure than the high cleanliness room, the loader comprising:

a movable stage positioned in the low cleanliness room for mounting the container to transport the dust free article in such a manner that the entire container remains in the low cleanliness room, and a cover to be removed from a main body of the container is positioned to face the high cleanliness room, the movable stage being horizontally movable relative to an opening portion;

the opening portion through which the dust free article is transported between the high cleanliness room and the container;

a door for opening and closing the opening portion, which is provided with a gap all around the door between the door and the opening portion;

a unifying means for unifying the cover of the container and the door in the low cleanliness room when the container approaches the door; and

a driving apparatus for opening and closing the opening portion of the loader and the container by moving the unified cover and door within the loader; and

wherein the container comprises:

an opening port through which the dust free article is transported between an inside of the container and the high cleanliness room;

a cover which covers the opening port of the container and is to be unified with the door of the loader, the cover and the door are adapted to move within the loader to open and close the opening port of the container; and

a fixing means for fixing the cover to the opening port of the container when the dust free article is set in the container and is transported.

25. (Previously Presented) The apparatus of claim 24, wherein the cover, unified with the door of the loader within the loader, moves vertically.

26. (Previously Presented) The apparatus of claim 24, wherein the driving apparatus for opening and closing the opening portion of the loader and the container by moving the unified cover and door within the loader is disposed within a space formed by a front cover and a wall for the driving apparatus.

27. (Previously Presented) The apparatus of claim 24, wherein the loader further comprises a driving device for causing the container mounted on the stage to approach the door.

28. (Previously Presented) The apparatus of claim 24, wherein the container further comprises an air-cleaning device.

29. (Previously presented) A method for transporting a dust free article, using a loader, provided with a movable stage, a door, a unifying means and a driving means, disposed in a low cleanliness room in a border portion between a high cleanliness room having a higher air pressure than that of the low cleanliness room, and a container receiving the dust free article to be transported, which comprises:

mounting the container receiving the dust free article on the movable stage horizontally movable relative to a wall that separates the low cleanliness room from a high cleanliness room, disposed on the loader in such a manner that the entire container remains in the low cleanliness room, and a cover to be removed from a main body of the container is positioned to face the high cleanliness room;

causing the container to approach the door of the loader for opening and closing an opening portion of the loader;

flowing air from the high cleanliness room to the low cleanliness room through a gap provided all around the door of the loader;

unifying the cover of the container and the door of the loader in the low cleanliness room;

moving the cover and the door unified within the loader to open the opening portion of the loader and the container; and

transferring the dust free article received in the container from an inside of the container to the high cleanliness room through the opening portion of the loader.

30. (Previously Presented) The method of claim 29, further comprising:

fixing the container mounted on the movable stage to the movable stage to unify the container in the movable stage; and

wherein causing the container to approach the door of the loader for opening and closing the opening portion of the loader is done by moving the movable stage by a driving device in the loader.

31. (Previously Presented) The method of claim 29, wherein the cover of the container and the door of the loader unified within the loader is moved vertically.

32. (Previously Presented) A loader comprising:

a movable stage for mounting a container in such a manner that the entire container remains in a low cleanliness room, and a cover to be removed from a main body

of the container is positioned to face a high cleanliness room having a higher pressure than the low cleanliness room, the movable stage being horizontally movable relative to a wall that separates the low cleanliness room from the high cleanliness room;

a door for opening and closing an opening portion, provided in the wall, for transporting a dust free article between an inside of the container and the high cleanliness room;

a unifying means for unifying the cover of the container and the door in the low cleanliness room;

a driving apparatus for moving the cover and the door together within the loader to simultaneously open and close the opening portion and the container; and

a gap provided all around the door through which air flows out from the high cleanliness room to the lower cleanliness room to prevent dust flowing into the high cleanliness room.

33. (Previously Presented) The loader of claim 9, wherein the driving apparatus is provided within a space formed by a front cover and a wall for the driving apparatus and the cover and the door are adapted to move vertically with the space.

34. (Previously Presented) The loader of claim 9, further comprising a second driving apparatus that is adapted to move the movable stage in a horizontal direction toward and away from the opening portion in the wall.

IX. EVIDENCE APPENDIX

As part of the Amendment submitted on August 1, 2006, Applicants submitted an article describing how the term "mini-environment" is understood as a "term of art" in the relevant art meaning a precisely controlled clean environment. A copy of this article is attached herein.

X. RELATED PROCEEDINGS APPENDIX

There are no other related appeals or interferences known to Appellants, Appellants' legal representatives, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Reconsideration and allowance of all of the claims is respectfully requested.

If there are any additional charges with respect to this Appeal Brief, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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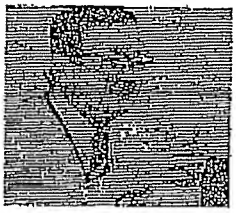
Manufacturing Technology

The Changing Cleanroom

SMIF Clean Minienvironment Technology

Introduced at Fab1 in Nagasaki. The first full adoption in a new line in Japan.

The image of dust being the problem is no longer appropriate.
With the current microscopic feature sizes in semiconductor processes, contamination even at the molecular level can adversely affect product quality.
As a result, interest is shifting from maintaining a fixed level of cleanliness in the whole room in which the semiconductor equipment is installed to thoroughly controlling the local space (minienvironment) around the wafer.
SMIF: Standard Mechanical Interface.
This technology was adopted throughout a complete line for the first time at Sony Computer Entertainment's Fab1 line in Nagasaki, a dedicated facility for manufacturing embedded DRAM logic LSIs for PlayStation2 that went on line in April 2000.
We spoke with Toshiro Kisakibaru about the process of this introduction.



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Conventional Clean Room (All Down Flow)
Air flows down from the ceiling and dust is removed to the floor. If the air flow is stable, class 1 is guaranteed. However, since the air flow can be disturbed by the way the equipment is installed or by personnel movement, it is difficult to maintain a consistent clean level.

SMIF Introduction
(Minienvironment) * An example of a multiple type
A pod that holds multiple wafer cassettes is placed in the loader (standby). At transfer time, only the pod is lifted up, and the cassettes are taken up from within the loader to the manufacturing equipment directly. Air from which chemicals have been removed is used to maintain the inside of the loader at class 1. The outside of the loader can be at class 1000 without affecting quality.

I've heard that SMIF was first used in Japan in 1985. Why was it not adopted immediately?

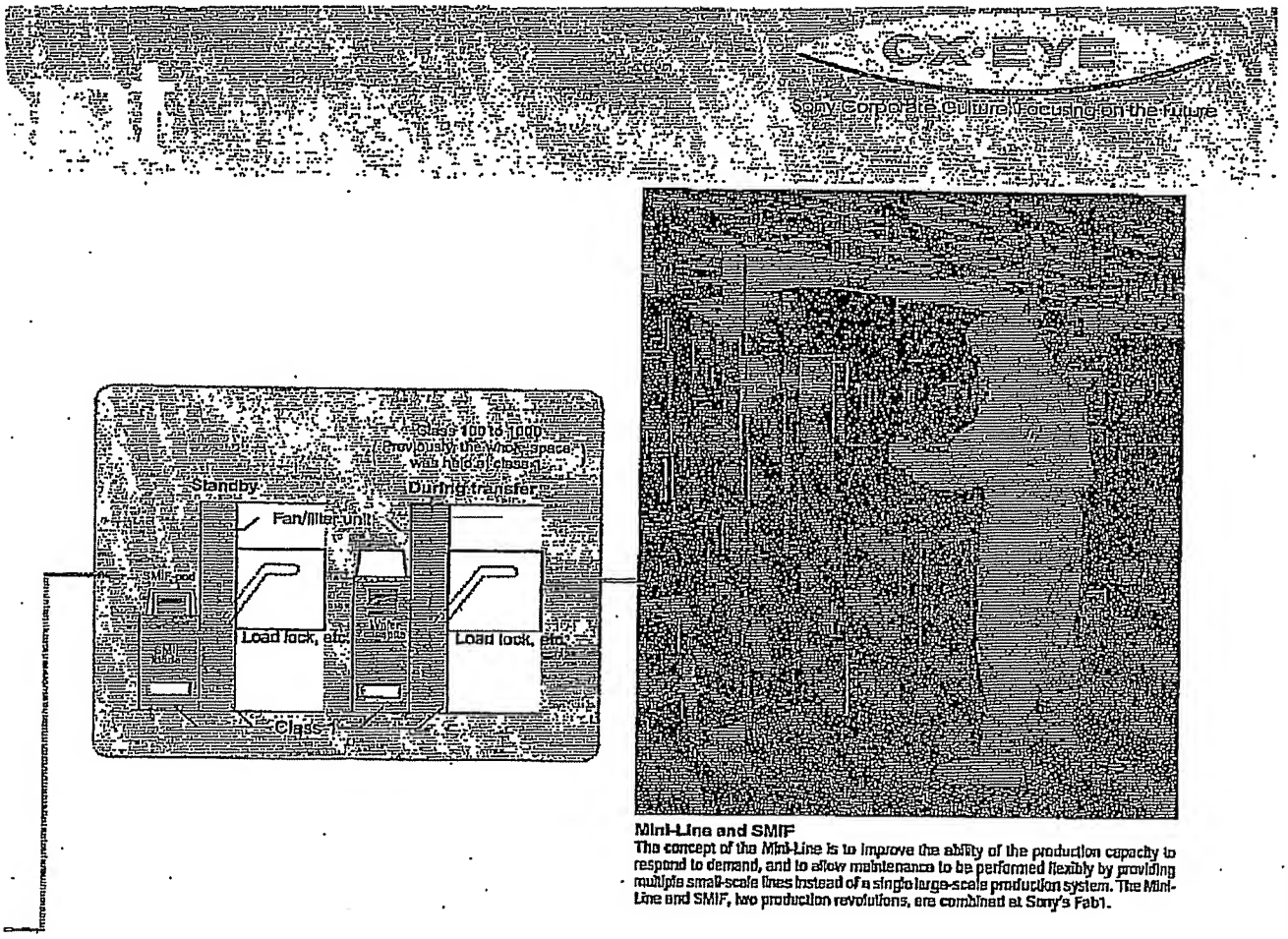
At that time "all down flow," that is the technique of maintaining cleanliness throughout a large space, was thought appropriate for use as the leading-edge semiconductor manufacturing environment. As a result, there simply wasn't much interest in SMIF.
Originally at that time SMIF had many problems, including the emission of high molecular weight gasses from the seal material of the pods (cases used to transport and store wafer cassettes), and disturbance of the air flow within the loader (the robot used to store and retrieve wafer cassettes) resulting in dust contamination. As a result, SMIF was adopted to a limited extent when lines were expanded, but never to the extent of using SMIF throughout a complete line.

Does that mean that full-scale adoption only began to be considered when quality and reliability were improved?

Well, yes. However, at the micro-fabrication levels used up to the present, conventional cleanrooms have been adequate, so it has been generally thought that the use of open cassettes, without going to the effort of enclosing the wafers in a pod, was adequate. However, when the design rules reach the 0.18 µm level, as they have at the Fab1 facility, ideally dust down to a 0.018 µm diameter, that is, one tenth of the design rule, should be considered a problem. However, due to requirements imposed by test equipment during testing, cleanliness is managed down to the level of dust one third the size of the design rules, namely particles with a diameter of 0.06 µm. Still, this is already at the molecular level. For devices with design rules smaller than 0.18 µm, the high molecular weight gasses emitted from building materials, cable insulations, and other organic materials can adversely affect device characteristics and reliability. It would be extremely difficult to implement measures to deal with this sort of chemical contamination for 10,000 to 20,000 square meter cleanrooms. Thus we think that it should be easier to manage cleanliness over limited areas.

Did you have any doubts or misgivings about introducing this approach in a full line for the first time in Japan?

First of all, a shortage of semiconductor device manufacturing capacity was forecasted in 1998, and we had already undertaken a feasibility study for the construction of a new building. In that study, we assumed we would use 300 mm wafers and Front Opening Unified Pods (FOUPs). Thus we were already prepared psychologically when decisions, which presupposed the introduction of SMIF at Fab1, were made at the end of 1998. However, we had already received reports that manufacturers outside Japan had



Mini-Line and SMIF
The concept of the Mini-Line is to improve the ability of the production capacity to respond to demand, and to allow maintenance to be performed flexibly by providing multiple small-scale lines instead of a single large-scale production system. The Mini-Line and SMIF, two production revolutions, are combined at Sony's Fab1.

been experiencing troubles with SMIF, and we had heard that other Japanese semiconductor manufacturers had doubts and were planning on waiting and seeing how Sony did. Which is to say, we saw SMIF as a challenge. Since there would be no turning back once Sony's leaders gave the word, we knew there would be no avoiding the issue.

> I've heard that this was called the "N project" since it is located in Nagasaki. What were the most difficult problems you faced in the first year after the plant came online?

Although you may think that all one needs to do is buy pods and loaders and connect them to the manufacturing equipment, it's actually very difficult. First, to attach standard loaders to equipment, such as washers, diffusers, RIE, and CVD units, with differing external dimensions required matching the dimensions of the acrylic mediation units with FFUs (power bezels) to each unit. In addition, we had to verify strictly both that the loader internal air flow was not disturbed, and that it was at a positive pressure (i.e. that the air pressure was higher than the external air pressure and thus dust entry was prevented) for each of around 400 loader units individually. To bring the SMIF system online, we brought 15 or 16 engineers from the US. However, there were major linguistic and cultural problems. It took us a long time to get them to understand that strict deadlines were required and to work closely with Sony engineers.

> What has been your feeling for the completed system?

It is close to ideal. When we measured how many dust particles got on a wafer, we found on average 0.3 particles per 100 transport operations. This is essentially a zero dust state.
The following is symbolic of SMIF performance. While we were running the line we had installed first to produce test samples, we transported in and installed the equipment for the next line right next to first line. This included opening up holes in the floor. Furthermore, we didn't even install partitions; we merely strung ropes so that no one would fall in. Despite all this, there were no problems due to dust. This would be unthinkable in any previous line.